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ACE Assessments in Career Education

Guide for Teachers

Technology Core

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Introduction

About This Guide

The *Assessments in Career Education* (ACE) *Guide for Teachers* has been developed to provide essential information and preparation guidelines for teachers. The intent of the guide is to serve as an instructional aid in the classroom. The guide is divided into seven sections:

Test Content — describes the content of the test.

Test Structure — describes the general format of the test.

Test Preparation — includes strategies for preparing students for taking an ACE examination, including written-response questions.

Achievement Levels — describes the six different levels of achievement.

Sample Questions — includes sample multiple-choice questions and sample written-response question.

General Scoring Criteria — shows the general criteria used to develop specific scoring guides for written-response questions.

Sample Student Work — includes examples of student work for the sample written-response question at different score points with commentary.

Teachers are encouraged to reproduce portions or all of the guide for classroom use.

Student Eligibility

The ACE in Technology Core may be taken by a student only one time. For this reason, it is important for students to take the examination when they are fully prepared. Prior to taking the examination, students should complete the appropriate coursework that provides instruction in all of the standards covered by the examination. For example, students enrolled in a two-year technology core program should wait until the end of their second year to take the ACE in Technology Core.

Test Content and Structure

Test Content

The ACE in Technology Core is based upon the knowledge and skills defined in the *Draft Interim Content and Performance Standards of the Superintendent's Challenge Initiative for Industrial and Technology Education, Grades 9-10, Technology Core.* These standards, as summarized below, share a substantial amount of content with their predecessor, the *Industrial and Technology Education Career Path Guide and Model Curriculum Standards.*

The content of this examination covers:

- communication systems, including telecommunications, technical and computer aided drawing, graphic communications, and photography and motion pictures
- modes of transportation for people and goods, including propulsion systems, controls, and related infrastructures
- energy technology, including energy sources, extraction and conversion processes, transmission, conservation, and storage systems
- production technology, including planning and design, construction and servicing structures, electro/mechanical systems, materials and processes, computer-aided manufacturing, and production management as they relate to construction and manufacturing activities
- microbiotechnology and biomedical technology processes and systems
- computer applications as they apply to present and future areas of technology
- past, present, and future impacts of technological developments on the environment

Test Structure

The ACE in Technology Core is administered in two 45-minute sessions. Each session consists of multiple-choice questions and a written-response question or problem-solving task.

The purpose of the multiple-choice questions is to assess students' knowledge in technology core. The multiple-choice questions vary in complexity. Some require students to apply concepts to solve problems. This portion of the examination is machine scored. Sample questions are provided on page 5.

The written-response questions or problem-solving tasks are designed to measure students' application of skills and knowledge. Students respond to questions about career-related situations. The written-response questions or problem-solving tasks are scored by technology core teachers and other professionals in the career area. Students are awarded a score point from one to four for each question, with four being the highest score. The sample multiple-choice and written-response questions, general scoring criteria, and sample student work and commentary are provided on pages 6–8.

Resource Documents

Copies of the *Draft Interim Content and Performance Standards of the Superintendent's Challenge Initiative for Industrial and Technology Education, Grades 9–10, Technology Core* are available at http://www.cde.ca.gov/challenge on the Internet.

Copies of the *Industrial and Technology Education Career Path Guide and Model Curriculum Standards* are available from the Publications Division, Sales Unit, California Department of Education, P.O. Box 271, Sacramento, CA 95812-0271 or by fax at (916) 323-0823

Test Preparation

Students should have a firm foundation in the essential skills needed for success in the career area tested. Sound preparation for ACE is built on classroom assignments that allow students to use and test their skills and knowledge regularly.

Students preparing for the examinations need to be able to articulate the major concepts in the career area being assessed. They must be able to analyze information, apply knowledge, solve problems, and explain their solutions.

Preparing Students for Written-response Questions

Using the sample written-response question in this guide (page 5):

- discuss the wording of the sample written-response question. Help students to identify and understand the key requirements of the question (i.e., what is being asked?).
- review the general scoring criteria (page 6) with students. This will help students better understand what is expected of them.
- discuss the student work samples. Focus on the differences between the score points.

In addition:

- plan a variety of classroom activities that require students to interpret, think through, and answer written-response questions. For example:
  - define and explain terms that are common in written-response questions (e.g., "in detail," "fully," "list" vs. "describe" vs. "explain").
  - model processes for "thinking through" and outlining answers to written-response questions.
  - model processes for incorporating details into answers to written-response questions.
- provide students with many opportunities to practice writing (e.g., through homework assignments, in-class projects, and classroom assessments).
- involve students in developing written-response questions and scoring guides related to content covered in your curriculum.
- have students evaluate their own answers to written-response questions, as well as the answers of their peers, using a scoring guide. Encourage students to discuss strategies for improving their own and others' work.
- allow students to revise/improve their answers to written-response questions, based on your feedback and/or the feedback of their peers.

As an instructor:

- when you help prepare your students for the written portion of the ACE examination, you are also helping them to become better writers.
- keep in mind that you can effectively impact your students' writing as you engage them in writing about real-world activities.
- resources at your school that are available to help enhance your students' writing skills include:
  - the *English-Language Arts Content Standards for California Public Schools* adopted by the California State Board of Education (http://www.cde.ca.gov/board/standards.html), in particular, the sections entitled "Writing" and "Writing and Oral English Language Conventions."
  - any writing initiatives currently being implemented at your high school.
  - the language arts and English language learner instructors at your high school and/or in your career cluster.

Test-taking Strategies

Several test-taking strategies may be helpful to students during an ACE examination.

When answering multiple-choice questions, students should:

- read the directions carefully.
- generate their own idea of the most accurate answer to a question before selecting from the answers provided.
- pace themselves by considering the number of questions and the time allowed.

When answering written-response questions, students should:

- read and understand all parts of the question.
- underline the key requirements of the question.
- think quickly of the main ideas that will serve as a framework for their response.
- briefly outline the main ideas in a logical sequence before responding.
- respond to all parts of the question.
- provide accurate, clear, and detailed examples that demonstrate their knowledge of the career-area topic covered.
- check their work when finished to make sure they have responded to all required components of the question.

Achievement Levels

Scores from the multiple-choice and written-response portions of the examination are combined to produce the student's overall achievement level. There are six achievement levels. Students who achieve level six are awarded high honors; those who achieve level five are awarded honors; and those who achieve level four are awarded recognition. Students who achieve level three or below are acknowledged for their participation.

Level 6

The student has demonstrated excellent knowledge, understanding, and application of the content and concepts of technology core. The responses:

- show excellent knowledge and understanding of technology core content and concepts.*
- demonstrate outstanding interpretive and analytical skills.
- present accurate information and ideas in a detailed, well-organized manner.

Level 5

The student has demonstrated strong knowledge, understanding, and application of the content and concepts of technology core. The responses:

- show substantial knowledge and understanding of technology core content and concepts.*
- demonstrate strong interpretive and analytical skills.
- present accurate information and ideas in an organized manner.

Level 4

The student has demonstrated solid knowledge, understanding, and application of the content and concepts of technology core. The responses:

- show good knowledge and understanding of technology core content and concepts.*
- demonstrate solid interpretive and analytical skills.
- present information and ideas in an organized manner with minor errors or omissions.

Level 3

The student has demonstrated basic knowledge, understanding, and application of the content and concepts of technology core. The responses:

- show basic knowledge and understanding of technology core content and concepts.*
- demonstrate some interpretive and analytical skills.
- present information and ideas in a somewhat organized manner with some errors, misconceptions, and/or omissions.

Level 2

The student has demonstrated limited knowledge, understanding, and application of the content and concepts of technology core. The responses:

- show minimal knowledge and understanding of technology core content and concepts.*
- demonstrate limited interpretive and analytical skills.
- present limited information; may lack organization and/or have misconceptions, errors, and omissions.

Level 1

The student has demonstrated little or no knowledge, understanding, and application of the content and concepts of technology core. The responses:

- show little or no knowledge and understanding of technology core content and concepts.*
- demonstrate little or no interpretive and analytical skills.
- present little or no information and have misconceptions and errors.

* A detailed description of the content covered by the ACE in Technology Core can be found on page 1.

Sample Test Questions

Sample Multiple-choice Questions

1. Which is the FIRST step in the problem-solving process?

   A. Conduct background research.

   B. Define the problem clearly.

   C. Develop alternative solutions.

   D. Brainstorm possible causes.

2. Gasoline engines typically have 4 strokes. How many strokes do diesel engines typically have?

   A. 1

   B. 2

   C. 3

   D. 4

ANSWER KEY: 1. B 2. D

Sample Written-response Question

You have started a business making and selling hand-painted greeting cards. You want to write letters and create flyers to advertise the cards. You also want to keep track of the money you receive from customers and the money you spend on supplies.

Three types of computer software you can use to meet your business needs are spreadsheet, desktop publishing, and word processing.

Explain in detail the most appropriate use of spreadsheet, desktop publishing, and word processing for your business.

What Students Are Expected to Accomplish

In their response to this question, students are expected to explain in detail the most appropriate use for each of the three computer software types—spreadsheet, desktop publishing, and word processing—as they relate to the greeting card business.

Student responses are scored on knowledge of the three software types and ability to apply this knowledge to specific business needs. Additionally, responses are expected to be well organized and clearly and effectively written.

General Scoring Criteria for Written-response Questions and Problem-solving Tasks

The general criteria for each score point are outlined below. These criteria are used to develop scoring guides that address the specific content in each written-response question or problem-solving task.

Score Point 4

Student response shows **excellent** knowledge and understanding. The response:

- completes all components of the question correctly.
- demonstrates in-depth understanding of relevant concepts.
- conveys knowledge coherently and effectively.

Score Point 3

Student response shows **substantial** knowledge and understanding. The response:

- completes all or most components of the question correctly.
- demonstrates understanding of relevant concepts; may overlook or misunderstand less important ideas.
- conveys knowledge clearly.

Score Point 2

Student response shows **partial** knowledge and understanding. The response:

- completes some important components of the question correctly.
- overlooks or misunderstands relevant concepts.
- conveys knowledge in a manner that may lack clarity.

Score Point 1

Student response shows **little or no** knowledge and understanding. The response:

- attempts to address important component(s) of the question but may do so incorrectly.
- demonstrates little or no understanding of relevant concepts.
- conveys knowledge in a manner that may lack clarity or focus or may impede understanding.

Sample Student Work

Score Point 4

The most appropriate computer software which I can use for my business are spreadsheets, desktop publishing, and word processing. These software are very effective in the type of work I want to produce. My greeting card business will run efficiently if I plan and advertise my business.

Spreadsheets can be very helpful for my business. With spreadsheets I will be able to keep track of all the money that I receive and all the money which I spend. The spread sheet program which I can use comfortably is the Claris Works software. Although Windows also has a spreadsheet program I prefer Claris works. I could also use spreadsheets for inventory purpose.

Desktop publishing will also be helpful in producing my flyers. With desktop publishing I can produce a flyer to advertise my business or also the item which I sell. With this software program I can make a flyer to my liking and feel free to change it at anytime. With Desktop publishing I could also produce business cards, posters, or signs to further advertise my business.

The final type of computer software I can use to meet my business needs is word processing. Word processing could be helpful for me and my business. It can help me to make requests, replies, thank you letters to my customers, and even a letter to a friend or relative. With word processing I am able to write a document and be able to change it so it will meet my needs.

Spreadsheets, desktop publishing, and word processing can be a great help for my business if I learn how to use and manage the program. The computer software will save me time and money and will make it easier for me to keep track of the money, the Inventory, and the supplies needed in order to meet my goals and keep my customers happy.

Commentary

The response demonstrates an excellent knowledge of computer applications. The response explains at least one appropriate use for each of the software applications (i.e., spreadsheet, desktop publishing, and word processing) as they relate to the greeting card business. The response directly addresses the specifics of the prompt and includes relevant and accurate information. A detailed explanation for each use (i.e., using the spreadsheet for inventory purposes) is provided for the software applications. The knowledge is conveyed coherently and effectively.

Sample Student Work

Score Point 3

Alright, I'm starting my own business and in order to keep track of every thing and have every thing organized I'm going to use spreadsheets, desktop publishing and word processing. The most appropriate use of a spreadsheet that I can thing of would be to list all my materials and the gross the company is making from the cards. I'd enter all the data into the computer system and pick the most simplest form of the spreadsheet I can. And every month I would print one out and keep it in a folder. Now, for desktop publishing I'd create my own cards and stationary. I would also create a logo to represent the company and always put it on the packaging a papers. Desktop publishing could be applied for further assistance in that field. And finally as for word processing I would star up the program and use if for letters, buisness letters and various other letters. Along with the spell-check and grammer-check, I'm all set! Well, that's what I'd use each item for.

Commentary

The response demonstrates a substantial knowledge of computer applications. The response correctly explains an appropriate use for the software applications as they relate to the greeting card business. The response generally addresses the prompt and incorporates relevant information. The explanation for the use of the spreadsheet and desktop publishing includes some detail (i.e., create my own cards, create a logo); however, the explanation used for word processing is more general (i.e., letters and more letters). Although technically correct, the word-processing response is limited. Overall, the knowledge is communicated clearly.

Score Point 2

In my business I could use spread sheets to organize how much money is coming in and out. I could the use desktop publishing to creat flyers. I could use word processing to create memos to my employers.

Commentary

The response demonstrates partial knowledge of computer applications (i.e., spreadsheets to organize money, desktop publishing for flyers, word processing for memos). The response does not specifically address the prompt, as it is generic to any business. Although the response addresses all three applications, the explanation lacks detail and is more representative of a list than an explanation. Overall, the response lacks development.

Score Point 1

You need a word process program to type up the letters. You also need spreadsheets to put out flyers to promote your company. Again you need desktop publishing so you can get cool graphics.

Commentary

The response demonstrates little or no knowledge of computer applications. Although the response does explain an appropriate use for word processing (i.e., types letters) and desktop publishing (i.e., graphics), the responses are general and lack detail. In addition, the response includes misconceptions and demonstrates a minimal understanding of computer applications and their relevance to the prompt. Overall, the response lacks clarity and focus.

Acknowledgments

Thank you to all of the students, teachers, school officials, representatives of higher education, and representatives of industry who have contributed to the development of the Assessments in Career Education (ACE). The ACE examinations are voluntary and rely on your cooperation and continuing support. Students contribute by making their best effort on the examinations. Teachers prepare students and encourage their success. School officials provide support by registering their districts and schools for the ACE examinations, acknowledging the importance of these career areas and understanding the need to recognize student achievement. Higher education and industry representatives ensure that the content of the examinations provides an appropriate foundation for further education, training, and work in a related career area.

We wish to acknowledge the members of the development and scoring leadership teams for their contributions to the ACE in Technology Core.

Bill Berggren
San Diego Unified
San Diego County

Mike Crepeau
WestEd

Richard Dahl
California Department of Education

Jim Dawson
Anaheim Union High
Orange County

Mike DeMiranda,
formerly of California State University,
Los Angeles
now at Colorado State University,
Fort Collins

Ed Duman
Antioch Unified
Contra Costa County

Eric Fischer
San Diego Unified
San Diego County

Neil Heinburger
San Diego City Unified
San Diego County

Colleen Hill
California State University,
Los Angeles
Los Angeles County

Gary Jackson
Fresno Unified
Fresno County

Gene Karas
Klein Educational Systems

Dave McCready
East Side Union High
Santa Clara County

Kevin Pendergast
El Monte Union High
Los Angeles County

Walt Pitter
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Contra Costa County

Lisa Salmonson
Elk Grove Unified
Sacramento County

Les Thiessen
Sierra Unified
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